



## Time-series analysis of the relationship between air quality, temperature, and sudden unexplained death in Beijing during 2005-2008

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### Abstract:

**Background** There is a yearly increase in the rate of sudden unexplained death (SUD), even through extensive physical examination and the testing of a large number of biomarkers, the cause of sudden death in patients previously in good health cannot be fully determined. During clinical practice, a spatial aggregation phenomenon has been observed in the incidence of sudden unexplained death. Previous research has shown that environmental factors, such as air pollution, weather conditions, etc., have a significant impact on human health. In the wake of the continuous environmental damage, the relationship between environmental factors and sudden unexplained death still needs to be studied. To study the relationship between sudden unexplained death and air quality and temperature, commonly used markers such as particulate matter of aerodynamic diameter  $<10\text{ }\mu\text{m}$  (PM<sub>10</sub>), daily average concentration of the gaseous pollutants sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>), and the daily average temperature were investigated. **Methods** The methods include collecting the data of sudden unexplained death; air quality monitoring; meteorological monitoring from January 1, 2005 to December 31, 2008; utilizing generalized additive models (GAM); controlling the influential factors such as secular trend, seasonal trend, and Sunday dummy variable; and analyzing the correlation between daily inhalable particle concentration, daily average temperature, and the number of daily SUD. **Results** There was no statistical significance between the daily inhalable particle and daily incidence of sudden unexplained death. Incidence rate of sudden unexplained death had nonlinear positive correlation with daily temperature. When the temperature was 5°C above the daily average temperature, the daily incidence of sudden unexplained death went up with the rising temperature. **Conclusion** Temperature may be one of the key risk factor or precipitating factor of SUD.

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### Resource Description

#### Exposure : ☑

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

**Air Pollution:** Interaction with Temperature, Particulate Matter, Other Air Pollution

**Air Pollution (other):** SO<sub>2</sub>, NO<sub>2</sub>

**Temperature:** Extreme Heat

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## **Geographic Feature:**

resource focuses on specific type of geography

Urban

## **Geographic Location:**

resource focuses on specific location

Non-United States

**Non-United States:** Asia

**Asian Region/Country:** China

## **Health Impact:**

specification of health effect or disease related to climate change exposure

Morbidity/Mortality, Other Health Impact

**Other Health Impact:** sudden unexplained death

**Population of Concern:** A focus of content

## **Population of Concern:**

populations at particular risk or vulnerability to climate change impacts

Elderly

## **Resource Type:**

format or standard characteristic of resource

Research Article

## **Timescale:**

time period studied

Time Scale Unspecified